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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hiroyuki Ogawa

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7590

04/09/2009

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EXAMINER

HOANG, QUOC DINH

ART UNIT

PAPER NUMBER

2892

MAIL DATE

DELIVERY MODE

04/09/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/823,970	Applicant(s) OGAWA ET AL.	
	Examiner QUOC D. HOANG	Art Unit 2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,6-8 and 1622 is/are pending in the application.
- 4a) Of the above claim(s) 16-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,6-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Amendment filed on 12/16/2008 has been entered. Claims 1, 3, 6-8, and 16-22 are pending in the application. Claims 16-22 have been withdrawn from consideration.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka., (US Pat No. 6,756,675) in view of Applicants' Admitted Prior Art (AAPA), and further in view of Lin et al (US Pat 6,765,228).

Regarding claim 1, Tanaka teaches a semiconductor device comprising:

a pad metal layer (100) having a perimeter area and a center area;

a lower metal layer (200) having a plurality of apertures (130d-130f) below said center area of said pad metal layer, wherein said apertures are arranged into a plurality of rows each row comprising more than one of said apertures and a plurality of columns each column comprising more than one of said apertures;

an interlayer dielectric (150) formed between said pad metal layer and said lower metal layer wherein said interlayer dielectric layer covers a portion of the bottom of said pad metal layer;

a plurality of vias (612 614 616 618) formed in said interlayer dielectric, wherein said plurality of vias electrically couple said pad metal layer and said lower metal layer, and wherein said plurality of vias form a ring arrangement that is located above and outside of the region occupied by the aperture and below the outermost perimeter area of said pad metal layer; and

an protecting film (240) formed that covers said perimeter area of said pad metal layer wherein said protecting film covers a portion of the top of said pad metal layer and extends in the direction of said center area laterally inside of the innermost perimeter of the plurality of vias (see fourth embodiment and Figs. 9A-9B).

Tanaka teaches the interlayer dielectric (150) and the protect film (240), but fails to teach the protect film is an insulating dielectric layer. Also, Tanaka does not teach wherein the interlayer dielectric covers a portion of both the bottom and the sides of the pad metal layer and wherein the protecting film covers a portion of both the top and the sides of the pad metal layer, and wherein the center area is formed to accommodate a probe.

However, AAPA teaches the protect film (30) is an insulating dielectric layer. AAPA also teach wherein the interlayer dielectric (40) covers a portion of both the bottom and the sides of the pad metal layer (10) and wherein the insulating dielectric layer (30) covers a portion of both the top and the sides of the pad metal layer (10) (see Figure 1A). Since Tanaka and AAPA are all from the same field of endeavor, the purpose disclosed by AAPA would have been recognized in the pertinent art of Tanaka. It would have been obvious to a person of ordinary skill in the art at the time of the

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invention was made to provide the an insulating dielectric layer on the perimeter area of the pad metal layer in order to define the contact area on the top surface of the metal pad layer as taught by AAPA, page 1, lines 20-30.

Tanaka and AAPA teach the pad having a perimeter area and a center area, but does not teach wherein the center area is formed to accommodate a probe.

However, Lin teaches the pad (14) having a perimeter area and a center area, wherein the center area is formed to accommodate a probe (34) (col. 2, lines 35-40 and Fig. 3). Since Tanaka and Lin are all from the same field of endeavor, the purpose disclosed by Lin would have been recognized in the pertinent art of Tanaka. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the center area to accommodate a probe in order to have electrical contact with device as taught by Lin, page 2, lines 35-40.

Regarding claim 3, Tanaka teaches wherein said vias are filled with tungsten (col. 6, line 55).

Regarding claim 6, Tanaka teaches a bonding wire (180) is connected to the pad metal 100, but does not teach wherein **a probing process** is performed on said center area of said pad metal layer. Although the Tanaka does not teach wherein a probing process is performed on said center area of said pad metal layer, the present of the process limitations on product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to the product. In re Stephen 145 USPQ 656 (CCPA 1965).

Regarding claim 7, Tanaka teaches a bonding wire (180) is connected to the pad metal 100, but does not teach wherein **a wire-bonding process** is performed on said center area of said pad metal layer. Although the Tanaka does not teach wherein a wire-bonding process is performed on said center area of said pad metal layer, the present of the process limitations on product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to the product. In re Stephen 145 USPQ 656 (CCPA 1965).

Regarding claim 8, Tanaka teaches wherein said semiconductor device is an integrated circuit chip (col. 11, line 28).

Response to Arguments

4. Applicant's arguments filed 12/16/2008 have been fully considered but they are not persuasive.

In response to applicant's argument on page 7 that Tanaka does not teach or suggest wherein said insulating dielectric layer covers a portion of both the top and the sides of said pad metal layer and extends in the direction of said center area laterally inside of the innermost perimeter of said plurality of vias as is recited in claim 1. The applicants also point out on page 8 that in FIGS. 9A-9B, the innermost vias shown are associated with structures 123 and 124. Examiner respectfully disagrees. Clearly in the last Office Action on 12/08/2008, the plurality of vias shown are associated with structures 612, 614, 616, and 618, and the innermost vias could be 614 and 616 (see figure 9A-9B). Therefore, the Tanaka does teach or suggest wherein said insulating dielectric layer covers a portion of both the top and the sides of said pad metal layer and

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extends in the direction of said center area laterally inside of the innermost perimeter of said plurality of vias.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on (571) 272-1708. The fax phone numbers of the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Quoc D Hoang/

Primary Examiner, Art Unit 2892